

**FINAL**

**SAMPLING AND ANALYSIS PLAN ADDENDUM NO. 1**  
**(FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN)**  
*Verification Soil and Soil Vapor Sampling at Corrective Action Area 11*  
*Alameda Point, Alameda, California*

*Environmental Remedial Action*  
*Contract Number N62474-98-D-2076*  
*Contract Task Order 0101*

*Document Control Number 9736*  
*Revision 0*

*December 15, 2005*

Submitted to:

U.S. Department of the Navy  
Base Realignment and Closure  
Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92100-4310

Submitted by:

Shaw Environmental, Inc.  
4005 Port Chicago Highway  
Concord, California 94520-1120

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Approved By: \_\_\_\_\_

*John C McMillan*  
John McMillan  
Shaw Environmental, Inc.  
Project Manager

Date: \_\_\_\_\_

*12/15/2005*

Approved By: \_\_\_\_\_

*Rose Condit*  
Rose Condit  
Shaw Environmental, Inc.  
Program Chemist

Date: \_\_\_\_\_

*December 8, 2005*

Approved By: \_\_\_\_\_

*Nars Ancog*  
Nars Ancog  
U.S. Navy Quality Assurance Officer

Date: \_\_\_\_\_

*12/15/2005*



**Shaw**™ Shaw Environmental, Inc.

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Project Manager

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Michelle Hurst, (1C/1E)  
Greg Lorton, 06CA.GL (1C/1E)  
Diane Silva, 05G.DS (1C/3E)

**Shaw Environmental, Inc.**

Chron  
Rose Condit, Concord (1C/1E)  
Shaw Project File, Concord (1C/1E)  
Lee Laws, San Francisco (1C/1E)  
Concord Library, Concord (1C/1E)  
John McMillan, Concord (1C/1E)  
Jim Perkins, Concord (1C/1E)

**Other**

Janet Argyres, Bechtel National Inc. (1C/1E)  
Karla Brasaemle, TechLaw, Inc. (1C/1E)  
Anna-Marie Cook, US Environmental Protection Agency (1C/1E)  
Judy Huang, Regional Water Quality Control Board (1C/1E)  
George Humphreys, RAB (1C/1E)  
Craig Hunter, Tetra Tech EM Inc (1C/1E)  
Marcia Liao, Department of Toxic Substances Control (1C/1E)

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FINAL  
SAMPLING AND ANALYSIS PLAN  
(FIELD SAMPLING PLAN/QUALITY ASSURANCE  
PROJECT PLAN) ADDITIONAL CORRECTIVE ACTION AT  
CORRECTION ACTION AREA 11, AREA 37  
DATED 06 AUGUST 2004

IS APPENDIX A OF THE FINAL WORK PLAN ADDENDUM  
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## **Acronyms and Abbreviations**

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|        |                                      |
|--------|--------------------------------------|
| bgs    | below ground surface                 |
| CAA    | Corrective Action Area               |
| CCR    | California Code of Regulations       |
| CTO    | Contract Task Order                  |
| DQO    | data quality objective               |
| EPA    | U.S. Environmental Protection Agency |
| IDW    | investigation-derived waste          |
| IT     | IT Corporation                       |
| mg/kg  | milligram(s) per kilogram            |
| mL/min | milliliters per minute               |
| MS/MSD | matrix spike/matrix spike duplicate  |
| Navy   | U.S. Department of the Navy          |
| PRC    | Preliminary Remediation Criteria     |
| QC     | quality control                      |
| RPM    | Remedial Project Manager             |
| RWQCB  | Regional Water Quality Control Board |
| SAP    | Sampling and Analysis Plan           |
| SOP    | Standard Operating Procedure         |
| TPH    | total petroleum hydrocarbon          |
| UST    | underground storage tanks            |

## 1.0 Introduction

---

Shaw Environmental, Inc. has prepared this Sampling and Analysis Plan (SAP) Addendum 1 to the *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Additional Corrective Action at Corrective Action Area 11, Alameda Point* (Shaw Environmental, Inc., 2004). This addendum provides complete guidance for all additional field soil and soil vapor sampling and analysis activities to be performed at Corrective Action Area (CAA) 11, Alameda Point, California. This SAP Addendum is to be used in conjunction with the parent SAP referenced above. The existing parent SAP applies, except where amended by this document.

Following completion of the biosparge operations associated with CAA-11, Area 37, soil samples will be collected from the vadose zone to determine the effectiveness of the remediation activities. In 2004, the San Francisco Bay Regional Water Quality Control Board (RWQCB) also suggested soil screening levels to assess potential impacts to indoor air. Consequently, soil samples will also be collected to verify attainment of cleanup goals.

The objective of this project is to sample soil for total petroleum hydrocarbons (TPH) and to compare the results to the Preliminary Remediation Criteria (PRC) for residential and nonresidential future use. The results of these comparisons may be used for documenting attainment of product removal goals, site closure, or to request a No Further Action finding. The soil results will similarly be compared to the suggested RWQCB screening levels for soil vapor.

This work will be conducted under Contract Task Order (CTO) 0101 of U.S. Department of the Navy (Navy), Southwest Division, Naval Facilities Engineering Command, Environmental Division, under Environmental Remedial Action Contract Number N62474-98-D-2076.

### 1.1 Site History and Background

Alameda Point is located in Alameda, California, as shown in Figure 1. Corrective Action Area 11 is located just east of the Seaplane Lagoon area of Alameda Point.

#### 1.1.1 Corrective Action Area 11 – Area 37

The corrective action initiative addressing CAA-11, Area 37, is primarily concerned with the fuel hydrocarbons released into the subsurface by leaking underground storage tanks (USTs) and associated fuel distribution lines. Historically, Area 37 served as a central storage point for a variety of fuels, including aviation gasoline, automotive gasoline, diesel fuel and lubricating oil. Thirty USTs were previously located in or around Area 37. A subsurface fuel distribution line that was located along the western boundary of Area 37 near the Seaplane Lagoon was removed. Salient site features are shown in Figure 2.

## **1.2 Scope and Objectives**

The scope of work for this SAP Addendum consists of the following tasks:

- Conduct verification soil boring and sampling beneath Area 37
- Conduct verification soil vapor sampling
- Perform investigation-derived waste (IDW) sampling and disposal

This SAP Addendum has the following objectives:

- Provide a rationale for field sampling activities
- Describe the sampling strategy and design
- Describe and establish consistent field sampling procedures
- Establish data gathering, sample handling, and documentation methods that will be employed during field activities

Soil and soil vapor samples will be collected and analyzed to achieve the project objectives. Analytical data collected under the provisions of this SAP Addendum will be used for the following purposes:

- Document soil and soil vapor conditions under Area 37
- Determine if the site soil cleanup goals have been met, and compare the soil vapor results to the suggested RWQCB screening levels
- Dispose of IDW

## **1.3 Project Organization**

The project organization chart has been updated as shown in Figure 3.

## **2.0 Data Quality Objectives**

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The data quality objective from the parent SAP does not address the additional soil and soil vapor sampling presented in this Addendum. This section describes the outcome of the seven step data quality objective (DQO) process for data collection activities under this Addendum.

### **2.1 Stating the Problem**

*Step 1: Identify the planning team members, including decision-makers, describe the problem, develop a conceptual model of the environmental hazard to be investigated, and determine resources such as budget, personnel, and schedule.*

The planning team consists of representatives from the Navy and Shaw, the prime contractor for the Navy Remedial Action Contract, with regulatory support and oversight from the RWQCB. The Navy is the lead federal agency for the direction of site activities and the prime decision-maker. The work will be conducted according to the Navy-approved budget and schedule.

Leaking USTs and associated fuel distribution lines are believed to be the principal cause of contamination to subsurface soil and groundwater at CAA-11. Under this CTO, Shaw will collect verification soil and soil vapor samples beneath Area 37 to address the extent to which previous biosparge operations remediated the site. The data collected may ultimately be used for site closure or to request a No Further Action finding for this site.

### **2.2 Identifying the Decisions**

*Step 2: Identify the principal study question; define alternative decisions; develop a decision statement; and organize multiple decisions.*

The decisions requiring environmental data acquisition will answer the following questions:

- What are the concentrations of contaminants of concern in the soil beneath Area 37?
- What are the concentrations of contaminants of concern in the soil vapor beneath Area 37?
- What are the disposal options for the soil waste generated?

### **2.3 Identifying Inputs to the Decisions**

*Step 3: Identify the information needed: determine sources for this information; determine the basis for determining the action level; and identify sampling and analysis methods that can meet the data requirements.*

### 2.3.1 Cleanup Goals

The biosparge action at Area 37 was implemented to reduce subsurface fuel hydrocarbons inadvertently released during Navy activities. The cleanup level for petroleum hydrocarbons is outlined in a letter to Mr. Brad Job, RWQCB entitled, *Preliminary Remediation Criteria and Closure Strategy for Petroleum-Contaminated Sites at Alameda Point, Alameda, California*, (Navy, 2001). Preliminary Remediation Criteria for total and dissolved hydrocarbons in soil and groundwater at Alameda Point are dependent upon the following criteria:

- The anticipated reuse of the specific site in question
- The proximity of the site to ecological receptors (including potential groundwater conduits)
- The beneficial uses and potential beneficial uses of the groundwater

Preliminary Remediation Criteria were developed as cleanup goals for fuel release sites at Alameda Point to attain low-risk soil and groundwater status in compliance with the *Regional Board Supplemental Instructions to State Water Board December 8, 1995, Interim Guidance on Required Cleanup at Low-Risk Fuel Sites* (RWQCB, 1996). Attainment of the PRC will allow the Area 37 site to be classified as a Low-Risk Fuel Site and a closure management strategy will be applied, as documented in the 1996 Interim Guidance Document.

Analytical results from soil samples will be compared to the PRCs to determine future actions for the site. The PRCs for soil in this area are shown in Table 1.

The shallow soil vapor screening levels stated in the RWQCB correspondence titled, *Regional Water Quality Control Board, San Francisco Bay Region, Screening for Environmental Concerns at Site with Contaminated Soil and Groundwater, Interim Final*, (RWQCB, 2005), will be used to determine if there is or will be a potential indoor air inhalation risk due to the presences of petroleum associated compounds in the soil at the site. The RWQCBs shallow soil vapor screening levels are summarized in Table 2.

Analytical results from waste material for off-site disposal will be compared to the requirements for defining hazardous water described in the California Code of Regulations (CCR) Title 22, 40 Code of Federal Regulations, and the disposal facility acceptance requirements.

## 2.4 Defining the Boundaries

*Step 4: Define target population of interest; specify the spatial boundaries that clarify what the data must represent; determine the time frame for collecting data and making decisions; determine the practical constraints on collecting data.*

Area 37 is approximately two acres in size (Figure 2) Groundwater varies seasonally from approximately 4 to 8 feet below ground surface (bgs). There are no practical constraints to data collection.

## **2.5 Developing a Decision Rule**

*Step 5: Specify an appropriate population parameter (mean, median, percentile); confirm that the action level exceeds measurement detection limits; and develop a decision rule (if...then statements).*

Decisions related to the attainment of the cleanup goals (PRC for soil for residential and non-residential future use), request for site closure and/or a no further action finding will be made based on analytical results from the soil and soil vapor samples collected. Decisions related to the selection of the disposal options for the IDW will be made upon review of the analytical results and by comparing them to the disposal facility acceptance requirements.

The following decisions may be made based on the results of the soil sampling and analysis:

### ***Verification Soil Samples***

- If the TPH concentrations in the soil beneath Area 37 are below the PRC for soil for residential and nonresidential future use (see Table 1), then the soil criteria for a “low-risk” site have been met and a request for a No Further Action finding for the site may be made.
- If the TPH concentrations in the soil beneath Area 37 are above the PRC for residential and non residential future use (see Table 1), then the soil criteria for a “low-risk” site have not been met, and additional remedial options will be discussed with the Navy Remedial Project Manager (RPM). Suggested additional remedial options may include the performance of shallow soil excavations, in accordance with the parent SAP (Shaw, 2004).

### ***Soil Vapor Samples***

- If the contaminant concentrations in the soil vapor are below the RWQCBs shallow soil vapor screening levels (see Table 2), then the soil vapor criteria have been met and a request for a No Further Action finding for the site may be made.
- If the contaminant concentrations in the soil vapor are above the RWQCBs shallow soil vapor screening levels (see Table 2), then the soil vapor criteria have not been met and additional remedial options will be discussed with the Navy RPM. Suggested additional remedial options may include the performance of shallow soil excavations, in accordance with the parent SAP (Shaw, 2004).

### ***Investigation-Derived Waste Streams***

- If soil waste is considered hazardous by law, then the waste will be transported for disposal at a state-approved hazardous waste disposal facility.
- If soil waste is considered non-hazardous by law, then the waste will be disposed of at a state-approved non-hazardous waste disposal/recycling facility.

## **2.6 Specifying Limits on Decision Error**

*Step 6: Determine the range of the parameter of interest; choose the null hypothesis; examine consequences of making an incorrect decision; specify a range of values where the consequences are minor (gray region); and assign probability values to points above and below the action level that reflect tolerable probability for potential decision errors.*

This step does not apply because sampling is not based on probabilistic designs. The number of samples to be collected is based on the existing experience of the Shaw project team and a systematic sampling scheme. To limit uncertainty in obtained environmental data, criteria for the precision, accuracy, representativeness, completeness, and comparability parameters and reporting limits for the contaminants of concern have been developed. The data that meet these criteria will be of definitive quality and of less uncertainty than the estimated data that do not meet the criteria.

## **2.7 Optimizing the Design for Obtaining Data**

*Step 7: Review the DQO outputs; develop data collection design alternatives; formulate mathematical expressions for each design; select sample size that satisfies the DQOs; decide on the most resource-effective design or agreed alternative; and document details in the SAP.*

The proposed soil boring sample locations have been selected based on previous sampling and address the known areas of historically elevated TPH contamination. The proposed soil vapor sample locations are based on formerly elevated TPH concentrations within the biosparge area. The sampling design is presented in Section 3.0, "Sampling and Analysis Strategy," of this SAP Addendum.

### 3.0 Sampling and Analysis Strategy

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This section discusses the sampling and analysis strategy for soil, soil vapor and waste samples required to meet the project DQOs.

Procedures for sample collection and handling are discussed in Section 5.0, "Field Methods and Sampling Procedures," of this SAP Addendum. The Standard Operating Procedures (SOP) referenced in these sections is part of Shaw's *Standard Quality Procedures and Standard Operating Procedures Manual* (IT Corporation [IT], 2000).

Table 3 presents a summary of sampling and analysis for the project activities.

#### 3.1 Verification Soil Sampling

Up to 5 soil borings will be placed inside Area 37. Proposed locations for 3 of the 5 soil borings are shown in Figure 2; the remaining 2 soil borings correspond to potential step outs, the locations of which will be based upon the analytical results of the 3 primary soil borings. The exact number of borings will also be influenced by subsurface conditions (i.e., subsurface obstructions) and RWQCB review of site data. Each soil boring will be advanced to a depth of approximately 5 to 6 feet bgs, using direct-push drilling techniques (or equivalent). One soil sample will be collected from each soil boring location. Soil samples will be collected at the depth where visually stained soil is observed. In the absence of visually stained soil, samples will be collected from the vadose zone at a depth of approximately 5 feet.

All soil boring samples will be collected following the procedures described in Section 5.2.1, "Subsurface Soil Sampling," and will be analyzed for the following parameter:

- Total petroleum hydrocarbons as motor oil by Environmental Protection Agency (EPA) Method 8015B

#### 3.2 Soil Vapor Sampling

Up to 14 soil vapor samples will be collected from inside Area 37. Proposed sample locations are shown on Figure 2.

The soil vapor samples will be collected following the procedures described in Section 5.2.2, "Soil Vapor Sampling Procedures," of this SAP Addendum and analyzed for the following parameters:

- Volatile organic compounds by EPA Method TO-15
- Total volatile petroleum hydrocarbons by EPA Method TO-3

### **3.3    *Investigation-Derived Waste Streams***

The project IDW will consist of soil cutting from borings. Analytical testing of IDW streams is discussed in Section 3.6, "Investigation Derived Waste," of the parent SAP (Shaw, 2004).

## 4.0 Analytical Requirements & Quality Control

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### 4.1 Analytical Methods

The following analytical methods will be used in this project:

#### *Verification Soil Sampling*

- *Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846, Update III* (EPA, 1996):
  - Total petroleum hydrocarbons as motor oil by EPA Method 8015B
  - Silica gel cleanup by EPA Method 3630C

#### *Soil Vapor Sampling*

- *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition* (EPA, 1999):
  - Volatile organic compounds in air by EPA Method TO-15
  - Total volatile petroleum hydrocarbons in air by modified EPA Method TO-03 (or TO-15)

#### *Investigation-Derived Waste Streams:*

- *Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846, Update III* (EPA, 1996):
  - Total petroleum hydrocarbons as diesel and motor oil by EPA Method 8015B
  - Volatile organic compounds by EPA Method 8260B
  - Semivolatile organic compounds by EPA Method 8270C
  - California Code of Regulations Title 22 metals by EPA Methods 6010B/7000
  - Closed System purge and trap by EPA Method 5035
- California Code of Regulations Title 22, 2002 (*Waste soil samples only*):
  - Soluble Threshold Limit Concentrations by California Waste Extraction Test and EPA Method 6010B
  - Toxicity Characteristic Leaching Procedure by EPA Methods 1311/6010B

Detailed information on methods, calibration criteria, project-required reporting limits, and quality control (QC) acceptance criteria are presented Section 6.0, "Laboratory Quality Control Program," of the parent SAP (Shaw, 2004).

## **4.2 Field Quality Control Samples**

Field QC samples will be collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples for this project will include field duplicates, equipment rinsate samples (if necessary), and temperature blanks.

### **4.2.1 Field Duplicates**

Field duplicate pairs consist of two samples of the same matrix (an original and a duplicate) collected at the same time and location to the extent possible, using the same sampling techniques. The purpose of field duplicate samples is to evaluate the variability of the contaminant distribution in the sampled matrix. Field duplicate samples will be collected at a frequency of 10 percent (1 field duplicate per 10 samples), and will be analyzed for the same parameters as their corresponding original samples. Duplicate samples will not be collected for waste samples.

### **4.2.2 Equipment Rinsate Samples**

Equipment rinsate samples are used to evaluate the effectiveness of the decontamination procedure and to identify potential cross-contamination during sampling events. For this project, disposable sampling equipment will be used to collect soil samples, which eliminates the need for equipment rinsate samples. If conditions change so that non-disposable sampling equipment is used, rinsate samples will be collected daily from decontaminated sampling equipment.

### **4.2.3 Temperature Blanks**

Each cooler will be shipped with a temperature blank. A temperature blank is a sample container filled with tap water and stored in the cooler during sample collection and transportation. The laboratory will record the temperature of the temperature blank immediately upon receipt of the samples.

### **4.2.4 Matrix Spike and Matrix Spike Duplicate**

The laboratory will analyze a matrix spike/matrix spike duplicate (MS/MSD) for soil will be collected. Field personnel will designate one sample for MS/MSD analysis on the Chain-of-Custody Form, and extra volume of soil will be submitted to the laboratory. Waste samples will not be submitted as MS/MSD samples.

## **5.0 Field Methods and Sampling Procedures**

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This section describes container and preservative requirements, sample collection, decontamination, and management procedures.

### **5.1 Sample Containers, Preservatives, and Holding Times**

Sample containers for soil will be certified pre-cleaned according to EPA protocols. Table 4 lists the sample container, preservative, and holding times required for water samples.

### **5.2 Sampling Method Requirements**

This section presents field methods and sampling procedures, sample handling, and documentation procedures. The descriptions provided in this section summarize the important points of the Shaw SOPs. Shaw SOPs will be kept on file at the job site for the field personnel's reference. Copies of the SOPs will be made available to the overseeing regulatory agency upon written request to the Navy RPM.

#### **5.2.1 Subsurface Soil Sampling**

Soil samples will be collected using direct push techniques (GeoProbe®) or equivalent. Samples will be collected from within the vadose zone at each site, which extends from surface to 5 to 6 feet bgs. GeoProbe® drilling technique typically incorporates a 2-inch minimum diameter outer casing and inner drive tube containing 1½-inch diameter or equivalent acetate liners. Soil samples will be collected using the sampling techniques described below:

- Direct the drilling subcontractor to the desired sampling location. Advance the drive tube (acetate liner, split spoon, or equivalent) into the subsurface, driving soil into the acetate liner.
- Remove the liner from the drive tube and expose soil for sample collection.
- Collect soil for analysis into the appropriate sample containers using a disposable scoop (or equivalent), or allow collected soil to remain in sample sleeves, covering both ends with Teflon™ sheets and plastic caps.
- Label, package, and prepare the samples for shipment to the laboratory in accordance with the procedures described in Section 5.1.4 through Section 5.1.5, of the parent SAP (Shaw, 2004). Place the samples in cold storage after collection.

#### **5.2.2 Soil Vapor Sampling Procedures**

The soil vapor samples will be collected using direct push drilling techniques per IT SOP-T-GS-021 10.1 and this section. Samples will be collected from shallow borings (locations shown in Figure 2) advanced to a maximum depths of less than of 5 feet bgs. One soil gas

sample will be collected from each boring location. One field duplicate sample will be collected at a frequency of 10%, at randomly selected boring locations. Soil vapor samples will be collected as follows:

1. Advance the sample probe into the subsurface at the appropriate location. Proceed to Step 2, but wait approximately 20 to 30 minutes before purging the line (Step 4).
2. Place hydrated bentonite around the drive rod to inhibit surface air migration down the outer portion of the drive rod.
3. Expose the screen; using a small pump, purge three probe volumes of air at an approximate purge rate of 200 milliliters per minute (mL/min).
4. Perform a leak test at every soil gas sample location during sample collection as described in Section 5.2.
5. Obtain passivated Summa<sup>®</sup> canisters, vacuum gauge and water filters from the off-site laboratory. Verify the canisters have a vacuum pressure of no less than 27 inches of mercury, prior to sample collection. Record the initial vacuum on the Chain of Custody or sample collection log.
6. If water vapor is expected to be present in the boring, then attach the water filter to the canister.
7. Attach the Summa<sup>®</sup> canister to the well and slowly open the canister valve to achieve a flow rate of approximately 200 mL/min to start sample collection. Stop sample collection when the Summa canister has approximately 1 to 3 inches of mercury vacuum remaining. After sample collection, close the Summa<sup>®</sup> canister valve and disconnect the filter.
8. Measure the final canisters vacuum pressure and record the final vacuum on the Chain of Custody or sample collection log.
9. Label the sample using the tag attached to the Summa<sup>®</sup> canister. Record the Summa<sup>®</sup> canister serial number on the COC form next to the sample identification. Store the canister properly to avoid exposure to high temperatures.
10. Package and prepare the samples for shipment to the laboratory in accordance with SOP-TS-FS-001, SOP-T-FS-003, and SOP-T-FS-006. Summa<sup>®</sup> canisters do not require cold storage and can be returned to the laboratory in the same packaging in which they were delivered.

### 5.3 Leak Test

Leakage during soil gas sampling may dilute samples with ambient air and produce results that underestimate actual site concentrations or contaminate the sample with external contaminants. Therefore, leak tests will be performed during the collection of each soil gas sample to detect the presence of leakage during sampling activities. A leak test dome will be placed over the

sampling probe at the surface. Under the dome, a rag moistened with Isopropyl Alcohol will be used as the tracer compound. If the tracer compound is detected in the sample, the cause shall be evaluated, determined and corrected through confirmation sampling, if necessary.

## **6.0 Data Management**

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### **6.1 Electronic Deliverables**

The electronic data deliverable (EDD) will be in ASCII format. The analytical laboratory will follow the requirements stated in the Laboratory Interface Document for the Analytical Laboratory EDD. At project closeout, Shaw will submit all analytical data to the Naval Installation Restoration Information Solutions (NIRIS) in the Naval Electronic Data Deliverables (NEDD) format.

## 7.0 References

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California Code of Regulations, 2002, Title 22, *Social Security, Division 4.5 Environmental Health Chapter 11 Identification and Listing Hazardous Waste, Article 3 Characteristics of Hazardous Waste, Characteristic of Toxicity.*

IT Corporation, 2000, *Shaw Standard Quality Procedures and Standard Operating Procedures Manual.*

Regional Water Quality Control Board, 1996, *Regional Board Supplemental Instructions to State Water Board December 8, 1995, Interim Guidance on Required Cleanup at Low-Risk Fuel Sites.*

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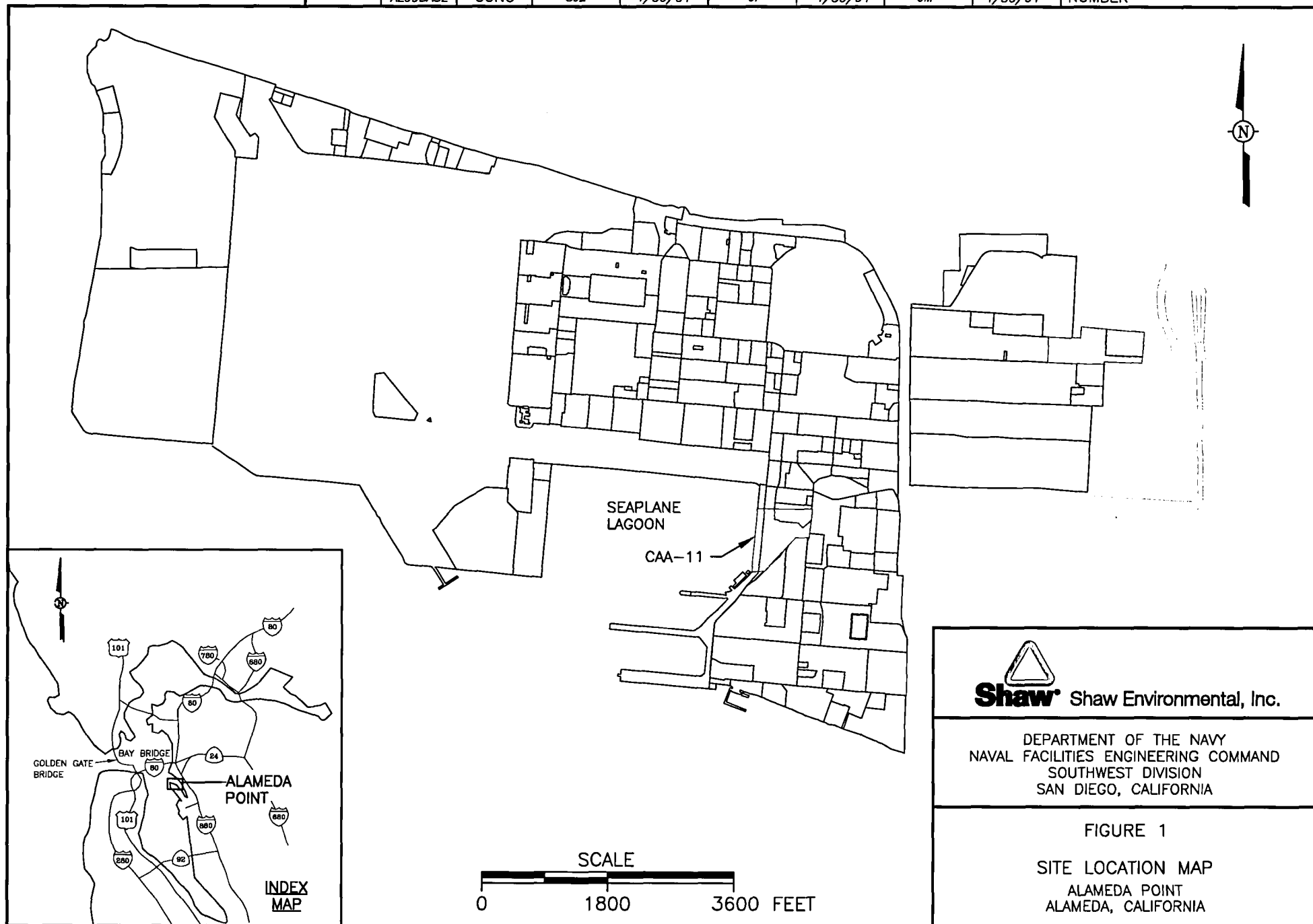
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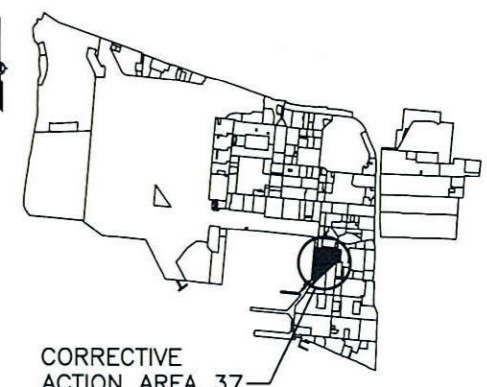
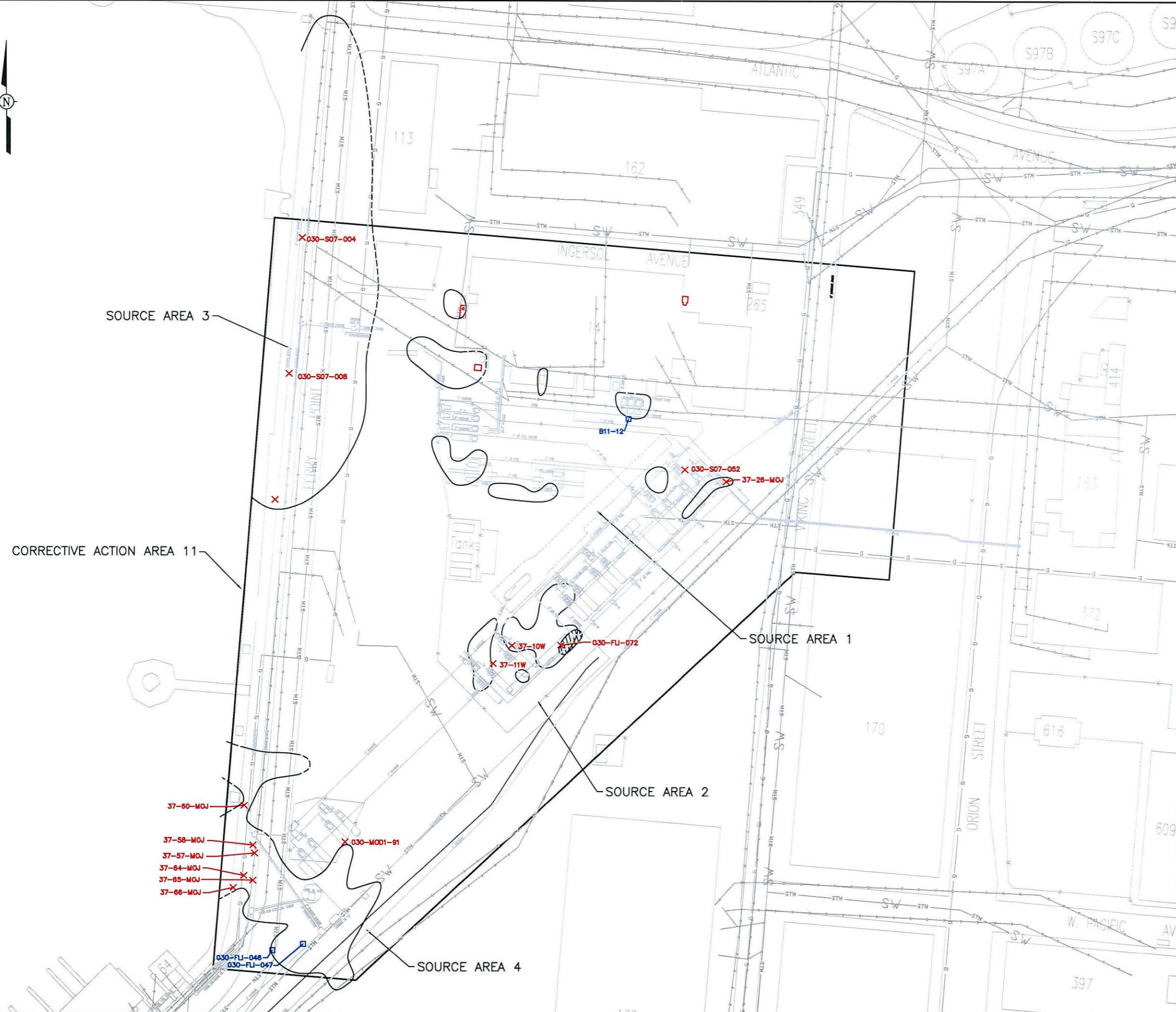
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## *Figures*

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| IMAGE | X-REF    | OFFICE | DRAWN BY |         | CHECKED BY |         | APPROVED BY |         | DRAWING NUMBER |
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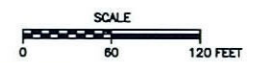


CORRECTIVE ACTION AREA 37

KEY PLAN

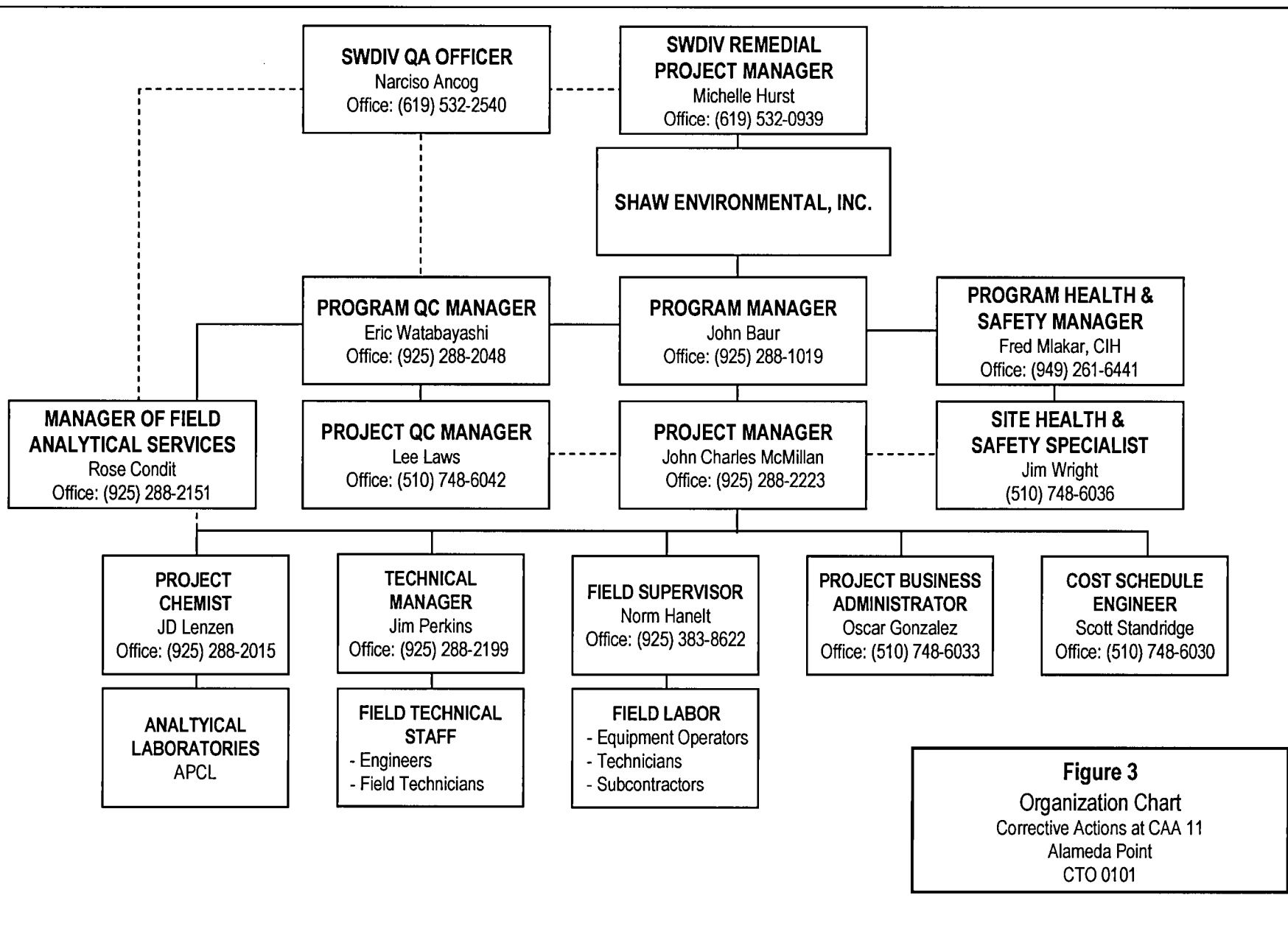
LEGEND

- GROUNDWATER TPH CONCENTRATION EXCEEDS 1.4 mg/L
- TPH-mo SOIL BORING SAMPLE
- TVPH/VOC SOIL VAPOR SAMPLE
- FENCE
- FACILITIES
- 4" GASOLINE FUEL PIPING LINES
- COMMUNICATION LINES
- ELECTRICAL LINES
- STEAM LINES
- GAS LINES
- FUEL LINES
- SANITARY SEWER LINE
- STORM SEWER LINE
- INDUSTRIAL WASTE LINE
- TELEPHONE LINE
- CABLE TV LINE
- SANITARY SEWER MANHOLE
- STORM DRAIN MANHOLE
- CATCH BASIN
- INDUSTRIAL WASTE MANHOLE
- FORMER UST (REMOVED)
- C.I. - CAST IRON
- RC - REINFORCED CONCRETE
- HYDRANT
- TRANSFORMER



DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND  
SOUTHWEST DIVISION  
SAN DIEGO, CALIFORNIA

FIGURE 2  
SITE FEATURES AND PROPOSED SOIL AND VAPOR SAMPLE LOCATIONS CAA-11  
AREA 37  
ALAMEDA POINT  
ALAMEDA, CALIFORNIA



**Figure 3**  
Organization Chart  
Corrective Actions at CAA 11  
Alameda Point  
CTO 0101

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## ***Tables***

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*(General notes for Tables follow Table 4)*

**Table 1****Verification Soil Sample Cleanup Goals for CAA-11, Preliminary Remediation Criteria**

| Analyte Name     | Residential Future Use Soil (mg/kg) | Nonresidential Future Use Soil (mg/kg) |
|------------------|-------------------------------------|--|
| TPH as Motor Oil | 1,900                               | 9,400                                  |

Source: Preliminary Remediation Criteria and Closure Strategy for Petroleum-Contaminated Sites at Alameda Point, Alameda, California, Letter dated May 16, 2001 from the Navy to Mr. Brad Job at the California Water Quality Control Board – San Francisco Bay Region.

**Table 2**  
**Shallow Soil Vapor Screening Levels for Protection of Indoor Air Quality**

| Chemical Parameters          | Reporting Limits<br>( $\mu\text{g}/\text{m}^3$ ) | Residential<br>Shallow Soil Vapor <sup>1</sup><br>( $\mu\text{g}/\text{m}^3$ ) | Occupational<br>Shallow Soil Vapor <sup>1</sup><br>( $\mu\text{g}/\text{m}^3$ ) |
|------------------------------|--|--|---|
| ACETONE                      | 0.5  | 73,000   | 500,000   |
| BENZENE                      | 0.5  | 84   | 700   |
| BROMODICHLOROMETHANE         | 0.5  | 66   | 550   |
| BROMOFORM                    | 0.5  | -  | -   |
| BROMOMETHANE                 | 0.5  | 1,000  | 7,500   |
| CARBON TETRACHLORIDE         | 0.5  | 58   | 490   |
| CHLOROBENZENE                | 0.5  | 13,000   | 9,000   |
| CHLOROETHANE                 | 0.5  | 2,900  | 25,000  |
| CHLOROFORM                   | 0.5  | 460  | 3,900   |
| CHLOROMETHANE                | 0.5  | 1,400  | 12,000  |
| DIBROMOCHLOROMETHANE         | 0.5  | 100  | 850   |
| 1,2-DIBROMO-3-CHLOROPROPANE  | 0.5  | -  | -   |
| DIBROMOETHANE, 1,2-          | 0.5  | 34   | 290   |
| DICHLOROBENZENE, 1,2-        | 0.5  | 42,000   | 290,000   |
| DICHLOROBENZENE, 1,3-        | 0.5  | -  | -   |
| DICHLOROBENZENE, 1,4-        | 0.5  | 220  | 1,900   |
| DICHLOROETHANE, 1,1-         | 0.5  | 1,500  | 13,000  |
| DICHLOROETHANE, 1,2-         | 0.5  | 110  | 950   |
| DICHLOROETHYLENE, 1,1-       | 0.5  | 49   | 410   |
| DICHLOROETHYLENE, Cis 1,2-   | 0.5  | 7,300  | 50,000  |
| DICHLOROETHYLENE, Trans 1,2- | 0.5  | 15,000   | 100,000   |
| DICHLOROPROPANE, 1,2-        | 0.5  | 140  | 1,200   |
| DICHLOROPROPENE, 1,3-        | 0.5  | 150  | 1,300   |
| ETHYLBENZENE                 | 0.5  | 210,000  | 1,500,000   |
| METHYLENE CHLORIDE           | 0.5  | 2,400  | 21,000  |
| METHYL ETHYL KETONE          | 0.5  | 210,000  | 1,500,000   |
| METHYL ISOBUTYL KETONE       | 0.5  | 17,000   | 120,000   |

**Table 2 (Continued)**  
**Shallow Soil Vapor Screening Levels for Protection of Indoor Air Quality**

| Chemical Parameters         | Reporting Limits<br>( $\mu\text{g}/\text{m}^3$ ) | Residential Shallow Soil Vapor <sup>1</sup><br>( $\mu\text{g}/\text{m}^3$ ) | Occupational Shallow Soil Vapor <sup>1</sup><br>( $\mu\text{g}/\text{m}^3$ ) |
|-----------------------------|--|---|--|
| METHYL TERT BUTYL ETHER     | 0.5  | 9,400   | 80,000   |
| NAPHTHALENE                 | 0.5  | 630   | 4,400  |
| STYRENE                     | 0.5  | 210,000   | 1,500,000  |
| TETRACHLOROETHANE, 1,1,2,2- | 0.5  | 42  | 360  |
| TETRACHLOROETHYLENE         | 0.5  | 410   | 3,500  |
| TOLUENE                     | 0.5  | 83,000  | 600,000  |
| TRICHLOROETHANE, 1,1,1-     | 0.5  | 210,000   | 1,500,000  |
| TRICHLOROETHANE, 1,1,2-     | 0.5  | 150   | 1,300  |
| TRICHLOROETHYLENE           | 0.5  | 1,200   | 10,000   |
| VINYL CHLORIDE              | 0.5  | 31  | 260  |
| XYLENES                     | 0.5  | 150,000   | 1,000,000  |
| TPH (middle distillates)    | 0.5  | 10,000  | 75,000   |

**1. Shallow Soil Vapor:** Defined as soil vapor sample data collected within 1.5 meters (five feet) from a building foundation or the ground surface. Assumes very permeable (e.g., sandy) fill material is present below building foundation or could be present below future.

**2. Source:** Regional Water Quality Control Board, San Francisco Bay Region, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, February 2005.

**Notes:**

Soil vapor screening levels intended to be protective of indoor air quality, calculated for volatile chemicals only.

Chemical considered to be "volatile" if Henry's number (atm m<sup>3</sup>/mole) > 0.00001 and molecular weight < 200 (see Table E-1).

Dibromochloromethane and pyrene considered volatile for purposes of modeling.

Target cancer risk = 1E-06, Target Hazard Quotient = 0.2

Residential soil vapor :indoor air attenuation factor = 0.001. Commercial/industrial soil vapor :indoor air attenuation factor = 0.0005.

**Table 3**  
**Summary of Field Sampling and Analysis**

| Location                            | Number of Field Samples | Number of QC Samples                             | Analysis  | Description   |
|-------------------------------------|-------------------------|--|---|---|
| <b>Soil Sampling</b>                |                         |  |   |   |
| Verification Soil Borings – Area 37 | Up to 5                 | 1 field duplicate<br>1 MS/MSD pair per 5 samples | TPH as motor oil (EPA 8015B)  | Up to 5 borings locations with one soil sample per boring. The exact depths of samples will be determined in the field based on depth to groundwater.         |
| <b>Soil Vapor Sampling</b>          |                         |  |   |   |
| Soil Vapor Samples – Area 37        | Up to 14                | 2 field duplicates                               | VOC (EPA TO-15)<br>TVPH (EPA TO-3)  | Up to 14 Soil Vapor samples. The exact depths and locations of samples will be determined based upon the location of the soil borings and associated samples. |
| <b>Waste Sampling</b>               |                         |  |   |   |
| Waste Soil                          | As necessary            | None   | VOC (EPA 5035/8260B)<br>TPH as diesel and motor oil (EPA 8015B)<br>SVOC (EPA 8270C)<br>CCR Title 22 Metals (EPA 6010B/7000)<br><i>If necessary</i><br>STLC (WET and EPA 6010B)<br>TCLP (EPA 1311/6010B) | Analysis and frequency per the direction of the Transportation and Disposal Coordinator and receiving facility requirements. The analysis shown may change.   |

**Table 4**  
**Sample Containers, Preservatives, and Holding Times**

| Analytes                    | Method         | Container <sup>(a)</sup>                      | Preservative  | Holding Time  |
|-----------------------------|----------------|---|---------------|---|
| <b>Soil</b>                 |                |   |               |   |
| TPH as diesel and motor oil | EPA 8015B      | 4 or 8 ounce glass jar with Teflon®-lined lid | Cool at 4±2°C | 14 days for extraction and 40 days for analysis               |
| VOCs                        | EPA 5035/8260B | 3 En Core® devices or equivalent              | Cool at 4±2°C | 48 hours for unpreserved<br>14 days for preserved             |
| SVOC                        | EPA 8270C      | 4 or 8 ounce glass jar with Teflon®-lined lid | Cool at 4±2°C | 14 days for extraction and 40 days for analysis               |
| Metals                      | EPA 6010B/7000 | 4 or 8 ounce glass jar with Teflon®-lined lid | Cool at 4±2°C | 180 days for all metals except mercury<br>28 days for mercury |
| <b>Vapor</b>                |                |   |               |   |
| VOCs & TVPH                 | TO-15<br>TO-3  | 1-6 L summa canister                          | None          | 14 days   |

(a) Additional sample containers will be provided for MS/MSD analyses.

## General Notes to Tables

*°C denotes degrees Celsius.*

*CAA denotes Corrective Action Area.*

*EPA denotes U.S. Environmental Protection Agency*

*mg/kg denotes milligram per kilogram.*

*MS denotes matrix spike.*

*MS/MSD denotes matrix spike/matrix spike duplicate..*

*QC denotes quality control.*

*STLC denotes Soluble Threshold Limit Concentrations.*

*SVOC denotes semi-volatile organic compound.*

*TCLP denotes Toxicity Characteristic Leaching Procedure.*

*TPH denotes total petroleum hydrocarbon.*

*VOC denotes volatile organic compound.*